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**When Disaster Strikes: Is Logistics and Contracting Support Ready?**

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Prepared for the Naval Postgraduate School, Monterey, California 93943

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## Preface & Acknowledgements

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During his internship with the Graduate School of Business & Public Policy in June 2010, U.S. Air Force Academy Cadet Chase Lane surveyed the activities of the Naval Postgraduate School's Acquisition Research Program in its first seven years. The sheer volume of research products—almost 600 published papers (e.g., technical reports, journal articles, theses)—indicates the extent to which the depth and breadth of acquisition research has increased during these years. Over 300 authors contributed to these works, which means that the pool of those who have had significant intellectual engagement with acquisition issues has increased substantially. The broad range of research topics includes acquisition reform, defense industry, fielding, contracting, interoperability, organizational behavior, risk management, cost estimating, and many others. Approaches range from conceptual and exploratory studies to develop propositions about various aspects of acquisition, to applied and statistical analyses to test specific hypotheses. Methodologies include case studies, modeling, surveys, and experiments. On the whole, such findings make us both grateful for the ARP's progress to date, and hopeful that this progress in research will lead to substantive improvements in the DoD's acquisition outcomes.

As pragmatists, we of course recognize that such change can only occur to the extent that the potential knowledge wrapped up in these products is put to use and tested to determine its value. We take seriously the pernicious effects of the so-called "theory-practice" gap, which would separate the acquisition scholar from the acquisition practitioner, and relegate the scholar's work to mere academic "shelfware." Some design features of our program that we believe help avoid these effects include the following: connecting researchers with practitioners on specific projects; requiring researchers to brief sponsors on project findings as a condition of funding award; "pushing" potentially high-impact research reports (e.g., via overnight shipping) to selected practitioners and policy-makers; and most notably, sponsoring this symposium, which we craft intentionally as an opportunity for fruitful, lasting connections between scholars and practitioners.

A former Defense Acquisition Executive, responding to a comment that academic research was not generally useful in acquisition practice, opined, "That's not their [the academics'] problem—it's ours [the practitioners']. They can only perform research; it's up to us to use it." While we certainly agree with this sentiment, we also recognize that any research, however theoretical, must point to some termination in action; academics have a responsibility to make their work intelligible to practitioners. Thus we continue to seek projects that both comport with solid standards of scholarship, and address relevant acquisition issues. These years of experience have shown us the difficulty in attempting to balance these two objectives, but we are convinced that the attempt is absolutely essential if any real improvement is to be realized.

We gratefully acknowledge the ongoing support and leadership of our sponsors, whose foresight and vision have assured the continuing success of the Acquisition Research Program:

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We also thank the Naval Postgraduate School Foundation and acknowledge its generous contributions in support of this Symposium.

James B. Greene, Jr.  
Rear Admiral, U.S. Navy (Ret.)

Keith F. Snider, PhD  
Associate Professor



## Panel 22 – Acquisition and Logistics in Support of Disaster Relief and Homeland Security

Thursday, May 12, 2011

1:45 p.m. –  
3:15 p.m.

**Chair: Rear Admiral Kathleen Dussault, SC, USN, Director, Supply, Ordnance, & Logistics Operations Division, Office of the Chief of Naval Operations**

***Strategies for Logistics in Case of a Natural Disaster***

Keenan Yoho and Aruna Apte, NPS

***An Analysis of U.S. Navy Humanitarian Assistance and Disaster Relief Operations (MBA Student Report)***

LT Cullen Greenfield and LT Cameron Ingram, USN

***Financing Naval Support for Humanitarian Assistance & Disaster Response: A Cost Analysis and Planning Model (MBA Student Report)***

LCDR Stephen Ures, USN

***When Disaster Strikes: Is Logistics and Contracting Support Ready?***

Aruna Apte and E. Cory Yoder, NPS

**Rear Admiral Kathleen Dussault**—Director, Supply, Ordnance and Logistics Operations Division (OPNAV N41). Rear Admiral Kathleen Dussault assumed duties as the director of Supply, Ordnance and Logistics Operations in the Office of Chief of Naval Operations (OPNAV N41) in March 2009. Dussault comes to OPNAV from her most recent assignment as commander of the Joint Contracting Command Iraq/Afghanistan, headquartered in Baghdad, Iraq, with 18 regional offices throughout both theaters.

Dussault graduated from the University of Virginia in 1977 with a Bachelor of Arts in American Government, received her commission through Officer Candidate School in Newport, RI, in November 1979, and graduated from Navy Supply Corps School in May 1980. Dussault has served in USS *Point Loma* (AGDS-2) in the Pacific Area Launch Support Ship for the Trident missile program as supply officer, USS *Concord* (AFS-5) as the assistant supply officer during Operations Desert Shield and Desert Storm, and as supply officer aboard USS *Seattle* (AOE-3), where she served as Afloat Logistics coordinator while deployed to the 5th Fleet operating area.

Dussault's shore tours include assistant supply officer and disbursing officer to the Navy Communications Station, Nea Makri, Greece; Defense Contract Administration Services Region (DCASR), Los Angeles; a negotiator and contracting officer at Naval Supply Center, Oakland, CA; procuring contracting officer for the Sidewinder and deputy for Missile Systems Acquisition at Naval Air Systems Command (NAVAIR); business and financial manager for programs managed by the Space and Naval Warfare Command; and executive assistant to the Deputy Assistant Secretary of the Navy for Acquisition Management within the office of the Assistant Secretary of the Navy for Research Development and Acquisition. In May 2001, Dussault assumed command of Defense Distribution Depot San Diego, and in April 2003 she assumed command of the Office of Special Projects, Arlington, VA. She then served as deputy director of Acquisition Management at Defense Logistics Agency, Fort Belvoir, VA. Prior to her combat assignment, she was assigned as deputy assistant secretary of the Navy for Acquisition and Logistics Management in Washington.



Dussault has earned a master's degree (with honors) in procurement management from Saint Mary's College in Moraga, CA, and a master's degree in national resource strategy from the Industrial College of the Armed Forces. She has achieved the highest levels of accreditation in Acquisition, Financial and Supply Chain Management and Joint Professional Military Education. Dussault is certified in production and inventory management through APICS, the educational society for resource management. She has completed the Executive Education Program at Columbia Business School.

Her decorations include the Defense Superior Service Medal, Legion of Merit, Bronze Star, Navy Meritorious Service Medal with two gold stars, Joint Service Commendation Medal, Navy Commendation Medal, Navy Achievement Medal with gold star and various unit citations, campaign medals and service medals.



# When Disaster Strikes: Is Logistics and Contracting Support Ready?

**Aruna Apte**—Assistant Professor, Department of Operations and Logistics Management, NPS. Professor Apte has successfully completed various research projects, involving application of mathematical models and optimization techniques that have led to over 20 research articles and one patent. Her research interests are in developing mathematical models for complex, real-world operational problems using optimization tools. She values that her research be applicable. Currently her research is focused in humanitarian and military logistics. She has several publications in journals, such as *Interfaces*, *Naval Research Logistics*, *Production and Operations Management*. She has recently published a monograph on Humanitarian Logistics (<http://dx.doi.org/10.1561/0200000014>).

Professor Apte received her PhD in Operations Research from Southern Methodist University in Dallas. She also has an MA in Mathematics from Temple University, Philadelphia. Before NPS she worked as a consultant at MCI and taught at the Cox School of Business, SMU, where she won the best teacher award. She has over 20 years of experience teaching operations management, operations research, and mathematics courses at the undergraduate and graduate levels. At NPS, she teaches mathematical modeling, for which she won the best teacher award, and she has advised over 50 students for over 24 MBA/Masters reports, out of which 10 students have worked and seven more are working in Humanitarian Logistics. She has also advised emergency planners in preparing for disaster response. She is the founding president for a new college (focus group) in Humanitarian Operations and Crisis Management under the flagship academic professional society in her intellectual area of study, Production and Operations Management Society. [auapte@nps.edu]

**E. Cory Yoder**—Senior Lecturer and Academic Associate for the MSCM Curriculum, Graduate School of Business and Public Policy, NPS. Mr. Yoder holds a BS in business management from Indiana University, an MA in national security and strategic studies from the Naval War College, and an MS in management from NPS. A retired naval commander, Yoder is Level III certified in contracting. [ecyoder@nps.edu]

## Abstract

Recent crisis responses, including the Department of Defense (DoD) and the United States (U.S.) integrated response to the 7.0-magnitude earthquake in Haiti, in which the DoD played a major role, can be examined and analyzed to determine how greater efficiencies and effectiveness may be achieved. Specific examination and analysis of actual logistics and contract capability in real-world response, including the DoD's ability to deliver the right mix of goods and services, when and where they are needed given limited resources, can be utilized to create a more robust capability for future events. This includes the ability to react more effectively and efficiently within the constraints of resources such as budget and manpower if contingency contracting is in place. We examine the planning and management of the DoD's logistics and contracting support for contingency, expeditionary, and crisis response and provide specific recommendations for optimizing response capability for future crisis response.

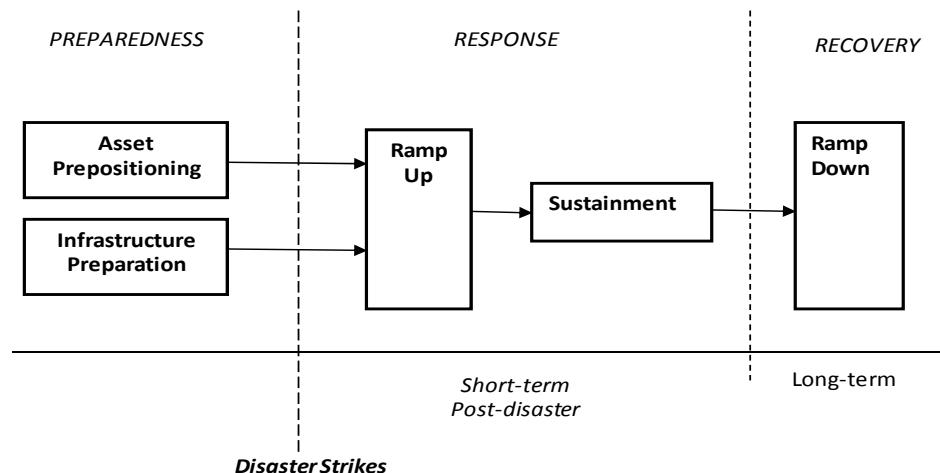
## Introduction

In the last few years, a substantial population of the world has suffered due to disasters, natural or manmade. In 2009, there were “335 natural disasters reported worldwide that killed 10,655 persons, affected more than 119 million others, and caused over \$41.3 billion in economic damages” (Vos et al., 2010). Recent crisis responses, including the DoD and U.S. integrated response to the 7.0-magnitude earthquake in Haiti, in which the DoD played a major role, can be examined and analyzed to determine how



greater efficiencies and effectiveness may be achieved. Currently, there exists a sub-optimization of capability due to lack of integrated analytical approach creating and executing crisis response. This is manifest in long lead times and high costs in acquisition and delivery of critical supplies and services in areas devastated by disaster. The negative effects of the inefficiencies and ineffectiveness of existing systems include but are not limited to loss of lives and property.

The life cycle of a disaster can be divided into three stages along the time line (Figure 1): preparedness efforts before the disaster strikes, response immediately after the disaster strikes, and recovery in the post-disaster period (Apte, 2009).



**Figure 1. Time Line of Humanitarian Supply Chain**  
(Apte, 2009)

When a disaster strikes, the response follows: donations and funding are solicited from donors, and sometimes supplies are obtained from pre-contracted vendors. Sometimes the supplies are obtained in advance, especially during the pre-positioning stages. The supplies received from donors and supplies purchased from vendors are then transported by various means to predetermined locations and distributed by emergency responders in the affected areas. The contracting for this transportation should also be predetermined for fast relief. However, the nature of the events creates uncertainties and, again, logistics and contracting have to create an efficient interface. The complexity of humanitarian logistics can be appreciated when the distribution process through this time line, along with the factors and characteristics of this supply chain, are taken into account.

Specific examination and analysis of actual logistics and contract capability in real-world response, including the DoD's ability to deliver the right mix of goods and services, when and where they are needed given limited resources, can be utilized to create a more robust capability for future events. This includes the ability to react more effectively and efficiently within the constraints of resources such as budget and manpower if contingency contracting is in place. Humanitarian logistics is a critical element of an effective and efficient disaster relief process (Apte 2009).

Recent and current examination of DoD crisis response capability indicates that the overall supply chain can be improved (Lodree & Taskin, 2009). Specifically, the response time, coordination of providers, contracting, and the capability to deliver the right mix of goods and services can be enhanced. The Government Accountability Office (GAO) REF indicates that coordination and planning efforts for domestic and international disasters must

be improved. This call for improved coordination to improve response extends to the logistics and contracting support communities within the DoD, the Department of the Army (DA), and other services and can be a key enabler for initial response improvement.

In Haiti, devastation caused by the earthquake dramatically impaired the capability of all rapid response efforts. The resulting extreme conditions made it difficult to deliver and transport much needed equipment, materials, supplies, and services to the Haiti earthquake victims and the first responders on the scene. This study will look into how the planners and coordinators utilized DoD contracting and logistics to provide relief to those in Haiti. Additionally, a comparative analysis of recent DoD humanitarian assistance operations will disclose best practices in DoD disaster relief as this study uncovers what went right, what went wrong, and what was learned in the first 100 hours of the Haiti Relief Effort.

In the immediate response phase, the demands of a disaster require an immediate response, and in order to do so, supply chains need to be designed and deployed at once, even though the knowledge of the situation is limited. Relief agencies should react with very little knowledge of the situation, and therefore, supply chains and logisticians need to be flexible and adaptable. Distribution is the most difficult situation, according to the authors. Getting the supplies where they need to be within the affected region is very difficult, and most of the time, these supplies are needed quickly. Distribution networks must be flexible, and this will require an adaptive coordination strategy between the various relief agencies. Decentralization is imperative in order to facilitate this flexibility (Kovács & Spens, 2007). Decentralized networks are more adaptive to the unpredictable effects caused by a disaster; they are less rigid and can be implemented in an area with a lot of unknowns.

Logistics is crucial to the planning stage of disaster relief. Strategic plans should incorporate logistics in order to ensure that the appropriate supplies and provisions are available and properly distributed. Many items needed in a disaster zone are well known and could easily be planned for. Many relief agencies tend to have purchasing agreements with companies that provide many of these disaster relief supplies. However, the gap is within the coordination between the capabilities of logistics agencies and the contracting community.

When disaster strikes, is logistics and contracting support ready? Such a question can only be answered if planning and management of the DoD's contracting and logistics for optimizing crisis response capability is studied. Further questions that need to be answered include the following: How can initial response time be improved? What will guarantee smooth supply of critical supplies and services? Are existing contracts in place? If not, can and should they be negotiated?

## **Literature Review**

### ***Academic Literature***

In light of recent high profile disasters, humanitarian groups and governments have shown a simple lack of preparation in combating the effects of the disaster (McCoy, 2008). Logistical obstacles have created greater suffering and highlighted the ineffectiveness caused by a lack of preparedness. Humanitarian groups have shown a complete lack in inter-organizational coordination and communication; due to the enormous effects caused by disasters, these groups must coordinate their efforts in order to achieve the greatest effect. Sometimes lack of coordination causes further problems where certain areas become overserviced and other areas are underserviced. Information and responsibilities of



participants may be redundant. As knowledge management systems are created, surplus operation can be eliminated and response efficiency improved.

Logisticians play a vital role in almost all aspects of society, and especially so in disaster relief zones (Thomas, 2003). Logistics is the life of any emergency aid operation, and without it, lives would be lost. The role of logistics is sometimes overlooked or taken for granted in these zones. Usually, logistics is where many relief operations struggle or even fail. Proper coordination between agencies requires adequate preparation before a disaster, but the lack of specific logistician creates planning inadequacies. Ultimately, humanitarian supply chains are very dynamic and complex, but only a few organizations place logistics high on their agenda. Logistics is viewed as a support function and not a strategic function within these organizations. Inadequate consideration leads to underfunding, which results in inferior logistics provided by the organization. Often times, logisticians are even left out of the planning process and, therefore, resort to reactionary measures and support a constant state of “firefighting” during a crisis. For the logistics function to be a strategic asset, donors and leaders of these organizations must pay attention to it.

Salmeron and Apte (2010) develop a two-stage stochastic optimization model to address shortcomings in current pre-disaster planning for humanitarian logistics. A key strategic issue is the pre-establishment of adequate capacity and resources that enable efficient relief operations. The optimization focuses on minimizing the expected number of casualties, so our model includes first-stage decisions to represent the expansion of resources such as warehouses, medical facilities with personnel, ramp spaces and shelters. Second-stage decisions concern the logistics of the problem, where allocated resources and contracted transportation assets are deployed to rescue critical population (in need of emergency evacuation), deliver required commodities to stay-back population and transport the transfer population displaced by the disaster.

There are substantial differences between commercial logistics and humanitarian logistics. Humanitarian logistics need to have zero lead times, often involve high stakes, and must sometimes utilize unreliable information; many operations are often ad hoc; and there is varying levels of enabling technology (Beamon, 1999). This is due to the unpredictable nature of humanitarian logistics. Logistics must be adaptive and flexible when operating in a disaster area, unlike the familiarity of commercial logistics.

The idea that private sector logistics can and should be applied to improve the performance of disaster logistics, but that before embarking on this, the private sector needs to understand the core capabilities of humanitarian logistics (Van Wassenhove, 2006). With this in mind, this paper walks us through the complexities of managing supply chains in emergency relief operations, as well as the possibilities of getting involved through corporate social responsibility. It also outlines strategies for better preparedness and the need for supply chains to be agile, adaptable, and aligned—a core competency of many humanitarian organizations involved in disaster relief and an area that the private sector could draw on to improve their own competitive edge.

The speed of humanitarian aid after a disaster depends “on the ability of logisticians to procure, transport, and receive supplies at the site of humanitarian relief effort” (Kovács & Spens, 2007). The authors created a framework that distinguishes between the actors, phases, and logistical processes of disaster relief. The authors also defined humanitarian logistics as the different operations at different times that occur to aid and help those affected by various catastrophes, which could be broken down into two fundamental parts: continuous aid work and disaster relief.



Furthermore, they defined disaster management as a process of several stages in order to implement humanitarian logistics. These stages include the following: preparing for the disaster, immediate disaster response, and reconstruction. In the preparing phase, the authors make the argument that while preventing and predicting disasters are nearly impossible, thus creating planning difficulty. Disasters are unpredictable with the exception of possible manmade disasters (e.g., war, terrorism, etc.); however, sufficient preparation can be made due to the likelihood of a disaster, such as preparing for earthquakes in fault zones, preparing for volcanic activity in cities near volcanoes, or preparing for hurricanes in hurricane-prone regions. Although the disaster itself cannot be predicted, the odds can be weighed. Preparedness has been crucial in many of these areas, and the lack of preparedness is evident in those areas not prepared. During their literature review, Kovács and Spens (2007) determined that a significant portion of planning for disasters lacked foresight into logistics and simply focused on reactionary measures such as evacuation routes.

The main operational problem that exists relates to distribution. Balcik, Beamon, and Smilowitz (2008) made the argument for a centralized distribution system consisting of various nodes spread across networks implemented within the affected region. This network would aid in coordination by providing a systematic model of organization for aid distribution utilizing a centralized system. Problems arise during a disaster, with many affecting the infrastructure within an area that oftentimes would be dependent upon during times of need. However, with a lack of such infrastructure, a new solution to move disaster relief supplies around the region would be needed. For the most part, the physical delivery of aid is a non-factor due to the ability to airdrop to even the most remote areas. However, the planning and coordination of the distribution of these supplies is a problem due to the sheer volume and number of relief agencies that may respond to a region. There are several factors and variables that must be taken into account that determine the means and methods of delivery. Thus, a flexible and adaptive plan is required utilizing various means of tracking and routing. However, the problem with a centralized planning and coordination system is whether or not one will gain participation among the various actors within the region. Centralization depends on factors that are interrelated. Therefore, if certain parts of the distribution fail, there exists a possibility that the entire plan may collapse.

Balick and Beamon (2008) created a model of a centralized distribution system for humanitarian relief operations. A centralized system would generalize the overall disaster and be completely contrary to the very nature of most disasters. If a centralized distribution system could be implemented, it would solve a majority of the problems associated with logistics within a disaster area. However, due to the complex nature and lack of information pertaining to the disaster, it is incredibly difficult to implement such a plan. Ad hoc networks combined with proper pre-planning would achieve the necessary flexibility in order to logically respond to a natural disaster. Unlike traditional commercial chains with pre-established logistical operations and can regularly be planned well in advance; humanitarian networks do not have this luxury.

Numerous case studies point out the importance of logistics as well as criticality of coordination among agencies that are downstream or upstream from the logistics in the entire supply chain. A 7.9-magnitude earthquake struck Gujarat, India, during a holiday in 2001. This earthquake was massive and widespread; the regions lack of codes and general unpreparedness for the earthquake caused more damage than was necessary. The earthquake's scale made implementation of any logistics plan difficult. There was significant use of an "IPT-like" team consisting of engineers, sanitation experts, earthquake specialists, and health experts set up to assess the damage and needs of the resulting humanitarian



mission (Samii, Van Wassenhove, Kumar, & Becerra-Fernandez, 2002). This is an excellent model due to the varying levels of certain disasters; it is imperative to have a group of knowledgeable experts to provide real data to the relief organizations in order to implement the correct actions for the distribution of aid.

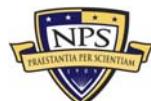
Samii et al. (2002) stress the importance of logistics. The logistics unit for this disaster had recently gone through a conversion. They were well-organized and versed in all aspects of logistics, including not only purchasing but also warehousing, supply chaining, management, and reporting. They also had two separate groups, which divided logistics between field activity and resource management. This seemed to work well. Additionally they had specialists pertaining to planning, coordination, and reporting. They also had a distribution specialist. The Red Cross had focused on their disaster management capability. Over the years, the IRFC had developed three main mechanisms and tools to respond to emergencies, which consisted of a funding mechanism, an assessment mechanism, and a mobilization mechanism. All three mechanisms allowed the IRFC to raise funds, quantify a disaster area, and react by distributing aid. The IRFC maintains a network of supplies throughout the world as well as numerous well-stocked donation centers in order to rapidly deploy resources in the event of a disaster.

By the end of its six-month mandate in Afghanistan, the United Nation Joint Logistics Center (UNJLC), an interagency emergency response coordination mechanism administered by the World Food Program (WFP), had accomplished its goals (Samii & Van Wassenhove, 2003a). It had supported humanitarian logistics planners in their efforts throughout the 2001–2002 Afghan winter and addressed cross-border and in-theater logistic bottlenecks. However, four months after the fall of the Taliban regime, the scale of the humanitarian crisis remained significant and the need for another year of operations was clear. The UNJLC, which had never been deployed for longer than six months, was asked on an extraordinary basis to continue its operation for one more year. The UNJLC utilized a pre-planned strategy that consisted of three prongs involving pre-positioning of aid, ensuring corridor accessibility, and developing contingency airlift capacity. The UNJLC took the entire potential factor within their region and developed an effective strategy to managing the crisis. They concluded that corridor access was the most important. They had to take into account the needs and constraints of the various regions and implement decisions based on transportation and pre-positioned stocks. UNJLC also used innovative thinking when they employed locals to participate with clear access via snow-blocked passes. This effort provided two factors for the people: cash and open access to relief aid and other types of communication and travel.

Relief efforts were organized to combat the effects of a quick succession of floods in Mozambique (Samii & Van Wassenhove, 2003b). The logistical constraints imposed by the floods made airlifts the only viable means of transportation. It was also the most expensive method. Given the great demand for air assets, there was a pressing need to enhance the efficiency and cost-effectiveness of the overall humanitarian relief effort. But, which humanitarian UN agency or NGO was to coordinate the use of the available air assets? The UNJLC was made up of a group of humanitarian logistics expert who formed a sort of logistics “IPT,” and they were tasked with coordination and communication among the various aid agencies within the affected region. They became the center point for all operations within the region. This reduced the confusion and redundancy of multiple agencies trying to provide aid.

### ***Official Documents***

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Recent disasters and the ability to effectively and efficiently respond has spawned several official published works related to disaster response. Of note are those from the Congressional Research Service (CRS), the Government Accountability Office (GAO), the United Nations (UN), the Federal Emergency Management Agency (FEMA), the RAND Corporation, and U.S. military commands including the Naval Postgraduate School (NPS).

The RAND Corporation published a comprehensive, albeit interim, work on response capabilities and organizations responsible for response and recovery efforts. (Moore et al., 2010). The RAND Report Number TR-764 found that federal funding supports preparedness initiatives across cabinet departments as well as grants to states and certain major metropolitan areas. At the local level, multiple agencies are grappling with a patchwork of federal funding streams and associated grant requirements. The RAND study determined that despite clear recognition, most disasters occur locally—or at least start that way—and most attention to date seems to have been on “top-down” planning from the federal level, representing stovepipe initiatives from different federal agencies. With that in mind, the Office of the Assistant Secretary of Defense for Health Affairs (ASD[HA]) in the DoD saw an opportunity to strengthen local level disaster preparedness planning by military installations and their civilian counterparts—local governments and local health-care providers, especially the Department of Veterans Affairs. The report examined the national policies for preparedness planning, examines preparedness utilizing a notional “risk-informed, capability-based” planning framework, and examines local civil and military preparedness and local support networks. RAND intends to continue research in this area in an effort to create and test a “concept of operations” for more coherent response capability. The proposed model will be specifically tailored to U.S. domestic response capability, but, the lessons from the work may prove valuable in creating international response capability as well.

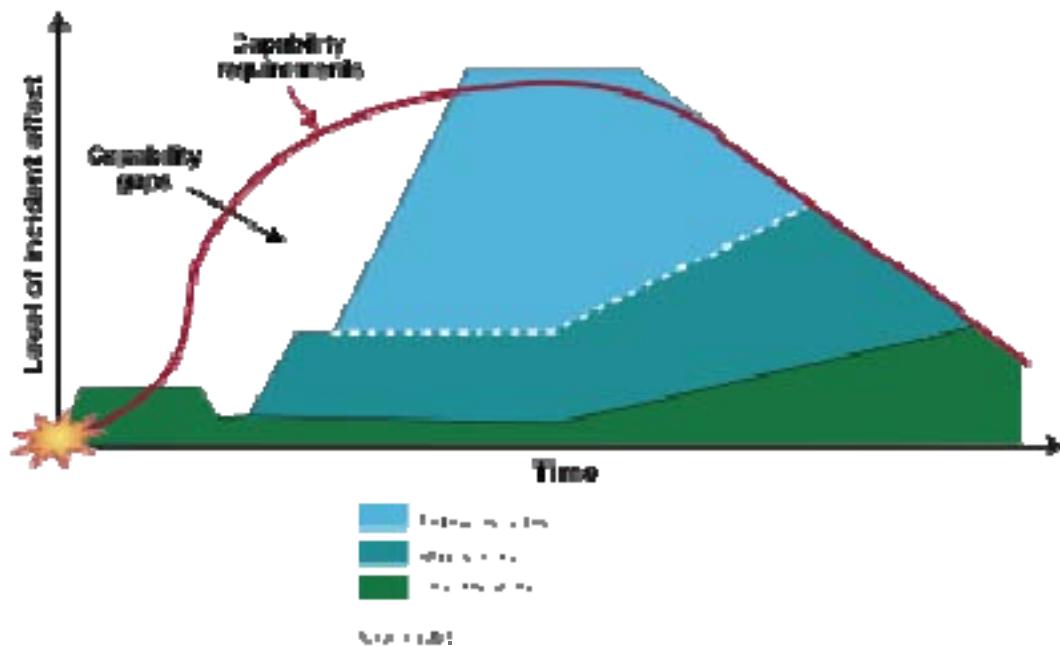
Another RAND Corporation publication, *Analysis of Risk Communication Strategies and Approaches with At-Risk Populations to Enhance Emergency Preparedness, Response, and Recovery*, examines the key role of communication in preparedness and response (Meredith et al., 2008). This published working paper represents results of a one-year study and assessment that involved review of the literature on emergency preparedness risk communication and public health messaging strategies; the compilation of educational and outreach materials for emergency preparedness communication with at-risk populations; and site visits in three states and the Washington, DC, area to identify gaps in the practice of risk communication with at-risk populations. The study emphasizes that community involvement in preparedness and response, to include key stakeholders and the media, improves capability in pre-event, event, and post-event disaster response.

The Government Accountability Office in March 2011 published “Measuring Disaster Preparedness: FEMA Has Made Limited Progress in Assessing National Capabilities,” a statement by William O. Jenkins Jr., Director of Homeland Security and Justice Issues (GAO, 2011). According to the testimony presented in the report, since 2002 Congress has appropriated over \$34 billion for homeland security preparedness through grant programs to enhance the capabilities of state, territory, local, and tribal governments to prevent, protect against, respond to, and recover from terrorist attacks and other disasters. Additionally, Congress enacted the Post-Katrina Emergency Management Reform Act of 2006 (Post-Katrina Act) to address shortcomings in the preparation for and response to Hurricane Katrina that, among other things, gave FEMA responsibility for leading the nation in developing a national preparedness system. The Post-Katrina Act requires that FEMA develop a national preparedness system and assess preparedness capabilities—capabilities needed to respond effectively to disasters—to determine the nation’s preparedness



capability levels and the resources needed to achieve desired levels of capability. Mr. Jenkins' testimony states that in September 2007, the DHS issued the National Preparedness Guidelines that describe a national framework for capabilities-based preparedness as a systematic effort that includes sequential steps to first determine capability requirements and then assess current capability levels. According to the Guidelines, the results of this analysis provide a basis to identify, analyze, and choose options to address capability gaps and deficiencies, allocate funds, and assess and report the results. This proposed framework reflects critical practices we have identified for government performance and results.

The report is significant in that it emphasizes the need to have measurable and demonstrable metrics to determine the state of preparedness and the capability to respond effectively and efficiently. Figure 2 highlights the concept presented, indicating the response capability of local, state, and federal responses over time and the theoretical gaps that can occur.



**Figure 2. Capabilities Requirements and Gaps**  
(GAO, 2011)

The Government Accountability Office also published *Hurricane Katrina: Planning for and Management of Federal Disaster Recovery Contracts*, which presented the testimony of William T. Woods, Director of Acquisition and Sourcing Management, and specifically addressed the planning and conduct of contracting in relation to Hurricane Katrina (GAO, 2006). The testimony report discussed how three agencies—the General Services Administration, the Federal Emergency Management Agency (FEMA), and the U.S. Army Corps of Engineers (the Corps)—conducted oversight of key contracts used in response to the hurricane. The GAO found three primary and specific deficiencies. First, there was inadequate planning and preparation in anticipating requirements for needed goods and services. Second, there was a lack of clearly communicated responsibilities across agencies and jurisdictions to ensure effective outcomes. And third, there were insufficient numbers and inadequate deployment of personnel to provide for effective contractor

oversight. Mr. Woods recommended several actionable items to remedy the deficiencies, including but not limited to the need to have competitively awarded contracts in place prior to the event against which orders can be placed as needed and better pre-planning and communications with other agencies prior to the alignment of responsibilities among the key officials in managing the award and oversight of contracts. This is but one of the many GAO published reports on the Hurricane Katrina response. In total, there are well over a dozen reports, and most indicate a lack of planning, coordination, and communication as key problems in effective response capability.

Recognizing the complexities of interagency communication and coordination of a wide array of agency and service cultures, the Department of Homeland Security published *Risk Steering Committee DHS Risk Lexicon, 2010 Edition*, dated September 2010 (DHS, 2010). Risk management and analysis supports specific homeland security missions and determines how homeland security functions can be best used to prevent, protect, mitigate, respond to, and recover from hazards to the Nation. The ability to communicate precise concepts and meanings is essential for effective risk-informed decision-making. Clear communication allows information to be used consistently to support decisions about the nature, cause, and severity of risks. This ability to communicate homeland security risk information with precision is critical to support decision-making at all levels throughout the DHS. While this document is primarily geared for the DHS, it's clear to the researchers that a universally recognized lexicon can prove beneficial to all agencies and services, particularly in communicating for logistics and contracting and developing sound business practices.

The Department of the Army and the U.S. Marine Corps' *Field Manual 100-19 Domestic Support Operations* (DA & USMC, 1993) is a primary document in the force structure, planning, and conduct of domestic operations, including disaster response capabilities on U.S. soil. The manual includes comprehensive chapters on concepts of operations, roles and responsibilities, legal considerations, logistics and support operations, community assistance, and training and education in domestic support. Its Chapter 5, entitled "Disasters and Domestic Emergencies," is a comprehensive guide on interagency roles and responsibilities, stages of response, and associated capabilities. According to the chapter summary, the Army and the DoD provide military support to civil authorities, especially in disaster assistance operations. The DoD is a supporting agency, providing military support to other lead federal agencies. The Secretary of the Army (SA) is the DoD's executive agent, and the Director of Military Support, or DOMS, is the SA's agent for disaster assistance support. In most cases, the Army will participate in disaster assistance operations as part of a DoD effort managed by the DOMS serving as a joint staff and commanded by a supported CINC. The Army is committed to providing timely and effective disaster assistance support to other federal agencies and the American people (DA & USMC, 1993). Despite being authored in 1993, the Army still utilizes this manual. The researchers contend that since many changes have occurred in statutes and policies, including revisions to the Stafford Act, this publication should be revised to reflect those changes and to include recent recommendations on logistics and contracting as required.

The Congressional Research Service (CRS) has published several reports on disaster response and disaster assistance. Of particular interest is the CRS report titled *The Use of Federal Troops for Disaster Assistance: Legal Issues*. (Elsea & Mason, 2008). Since the military is often called upon to provide logistic and contracting assistance in domestic disasters, the legal framework for the apportionment of active-duty military units is examined in relation to the Posse Comitatus Act and the Stafford Act. While these statutes deal with the use of armed military personnel involved in security and peacekeeping in domestic



operations, the aftermath of Hurricane Katrina, and the lack of observed law and order in New Orleans, in particular, and under special provisions can allow the use of active duty military for response. This report defined the legal framework in understandable language and is useful for any logistic and contract planner and executor.

The Naval Postgraduate School, primarily through its Acquisition Research Program, has published several research studies and working papers of interest. Of particular use for this research effort is *Phase Zero Operations for Contingency and Expeditionary Contracting—Keys to Fully Integrating Contracting Into Operational Planning and Execution* (Yoder, 2010). This sponsored research paper, published in August 2010, demonstrated a synergy that may occur when personnel credentialed in accordance with the author's recommendations are integrated into strategic operations planning and execution specifically for contract integration into all operations plans. The author contended that when the right mixes of personnel, platforms, and protocols are in place and utilized prior to an actual humanitarian crisis event, in phase zero, activities can be much more prepared for response in the event of an actual crisis.

The *Defense Contingency Contracting Handbook*, published by the Defense Procurement and Acquisition Policy and the Air Force Logistics Management Agency, provides a solid and fundamental guide for all DoD practitioners for humanitarian and expeditionary operations. In particular, Chapter 9, titled "Domestic and Overseas Disaster Response," is wholly dedicated to the topic. Within the text, the unique roles of various federal agencies, including FEMA and the DoD, are addressed. The chapter also provides an overview of FAR Part 18 Emergency Acquisition Authorities. Mr. Shay Assad, Director of Defense Procurement and Acquisition Policy, endorsed this handbook for use in all DAU CON 234 Contingency Contracting courses and that delivery equivalent credential.

## Forward Direction for This Research Effort

The researchers will continue to investigate and analyze information and data pursuant to providing solid findings, conclusions, and recommendations to further improve the efficiency and effectiveness of logistics and contracting in responding to crisis.

This effort will result in additional chapters to include the following:

- Data collected
  - *Response supply chain*
  - *Contingency contracting*
- Analysis
  - *Deficiencies in each area*
  - *Gap between the two*
  - *How do we fix it?*
- Conclusion
  - *Summary of what we did*
  - *Recommendation*
  - *Way forward*

## References

Apte, A. (2009). Humanitarian logistics: A new field of research and action. *Foundations and Trends® in Technology, Information and OM*, 3(1), 1–100.

Balcik, B., & Beamon, B. M. (2008). Facility location in humanitarian relief. *International Journal of Logistics: Research & Applications*, 11(2), 101–121.



Balcik, B., Beamon, B. M., & Smilowitz, K. (2008). Last mile distribution in humanitarian relief. *Journal of Intelligent Transportation Systems*, 12(2), 51–63.

Beamon, B. M. (1999). Measuring supply chain performance. *International Journal of Operations & Production Management*, 19( 3), 275–292.

Defense Procurement and Acquisition Policy (DPAP)—Contingency Contracting. (2010, June). *Defense contingency contracting handbook*. Washington, DC: DPAP and Air Force Logistics Management Agency.

Department of the Army (DA). (1993). *Department of the Army and the U.S. Marine Corps' field manual 100-19 domestic support operations* (No. FM-100-19).

Department of Homeland Security (DHS). (2010, September). *Risk steering committee DHS risk lexicon* (2010 ed.). Washington, DC: Author.

Elsea, J., & Mason, C. (2008, November). The use of federal troops for disaster assistance: Legal issues (CRS Report No. RS2226). Washington, DC: Congressional Research Service (CRS).

GAO. (2006, April). *Hurricane Katrina, planning for and management of federal disaster recovery contracts: Statement of William T. Woods, Director, Acquisition and Sourcing Management* (GAO-06-622T).. Washington, DC: Author.

GAO. (2011, March). *Measuring disaster preparedness: FEMA has made limited progress in assessing national capabilities: —Statement of William O. Jenkins, Jr., Director, Homeland Security and Justice Issues* (GAO-11-260T). Washington, DC: Author.

Kovács, G. & Spens, K. M. (2007). Humanitarian logistics in disaster relief operations. *International Journal of Physical Distribution & Logistics Management*, 37( 2), 99–114.

McCoy, J. H. (2008). Humanitarian response: Improving logistics to save lives. *American Journal of Disaster Medicine*, 3(5), 283–293.

Meredith, L., Shugarman, L., et al. (2008, December). *Analysis of risk communication strategies and approaches with at-risk populations to enhance emergency preparedness, response and recovery* (RAND working paper No.WR-598-HHS). Santa Monica, CA: RAND.

Moore, M., Wermuth, M. A., et al. (2010). *Bridging the gap: Developing a tool to support local civilian and military disaster preparedness* (RAND Report No. TR-764). Santa Monica, CA: RAND.

Salmeron, J., Apte, A. (2010, September). Stochastic optimization for natural disaster asset prepositioning. *Production and Operations Management*.

Samii, R., & Van Wassenhove, L. N. (2003a). *The United Nations Joint Logistics Centre: The Afghanistan crisis* (Report No.052003-5092). Fontainebleau, France: INSEAD.

Samii, R., & Van Wassenhove, L. N. (2003b). *The United Nations Joint Logistics Centre (UNJLC): The genesis of a humanitarian relief coordination platform* (Report No.04/2003-5093). Fontainebleau, France: INSEAD.

Samii, R., Van Wassenhove, L. N., Kumar, K., & Becerra-Fernandez, I. (2002). *Choreographer of disaster management: The Gujarat earthquake* (Report No. 602/046/1). Fontainebleau, France: INSEAD.

Thomas, A. (2003). *Humanitarian logistics: Enabling disaster response*. Fritz Institute, 15.

Van Wassenhove, L. N. (2006). Humanitarian aid logistics: Supply chain management in high gear. *Journal of Operational Research Society*, 57(5), 475–489.



Vos, F., Rodriguez, J., Below, R., & Guha-Sapir, D. (2010). *Annual disaster statistical review 2009: The numbers and trends*. Brussels, Belgium: Centre for Research on the Epidemiology of Disasters.

Yoder, E. C. (2010, September). *Phase zero operations for contingency and expeditionary contracting: Keys to fully integrating contracting into operational planning and execution* (Sponsored Report Series NPS-CM-10-160). Monterey, CA: Naval Postgraduate School.





Graduate School of  
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# When Disaster Strikes: Is Logistics and Contracting Support Ready?

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8th Annual Acquisition Research Symposium  
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Operations and Logistics Management  
Graduate School of Business and Public Policy  
Naval Postgraduate School, Monterey, CA



On one hand, in 2009 alone

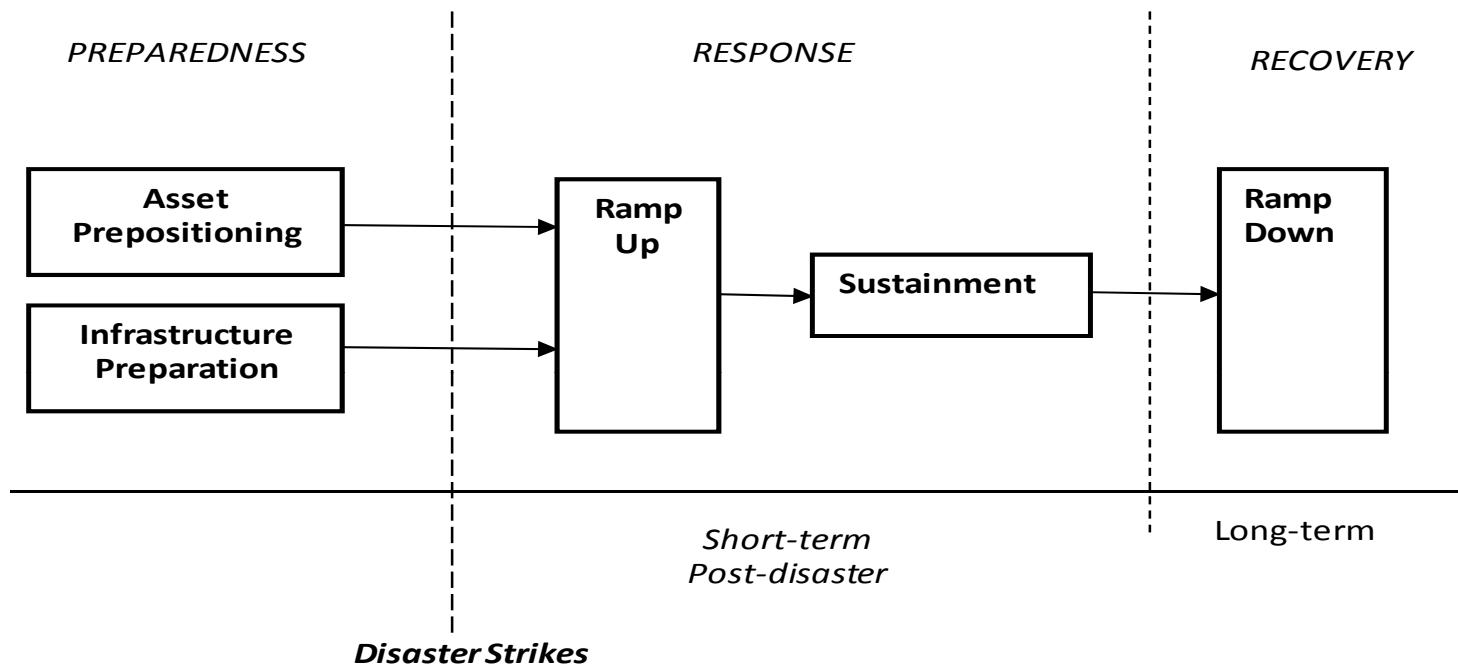
- there were 335 natural disasters
- that killed 10,655 persons
- affected more than 119 million others
- caused over \$41.3 billion in economic damages

On the other hand, there exists a sub-optimization of capability

- due to lack of integrated analytical approach creating and executing crisis response
- this is manifested in long lead-times and high costs in dollars as well as casualties



# Life-cycle of a Disaster





Our question of interest is,

When Disaster Strikes: Is logistics and contracting support ready?

This interest further leads to:

- How can initial response time be improved?
- What will guarantee smooth supply of critical supplies and services?
- Are existing contracts in place?
- Has DOD incorporated sound doctrine and practice?



# Some Challenges in Humanitarian Logistics

A response supply chain of critical supplies and services with

- demand surges
- uncertain supplies
- critical time-windows
- infrastructure vulnerabilities
- vast scope and size of the operations



# Some Parallel Challenges in Contingency Contracting

- statutory and regulatory compliance (CICA, FAR, etc.)
- lack of surge capacity in contracting organizations
- critical response time at odds with procurement lead times
- scope and size of requirements – often uncertain
- coordination amongst requirements generators, providers and contracting personnel

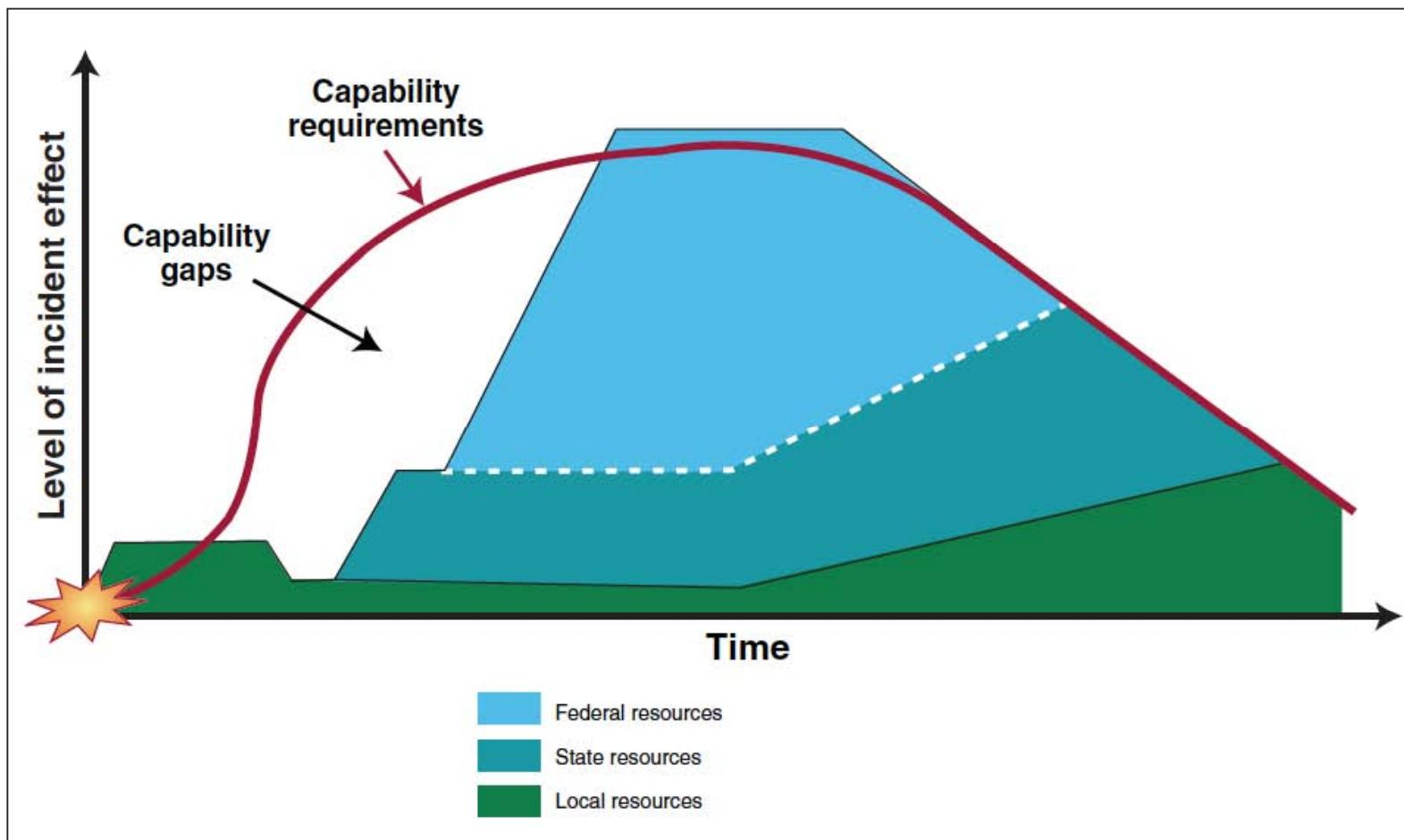


# Motivation for Integrating Logistics and Contracting

- One of the factors leading to effective prepositioning is contingency contracting.
- No response can be efficient unless appropriate supplies and provisions are available and properly distributed.
- Many relief agencies tend to have purchasing agreements with companies that provide many of these disaster relief supplies.
- However, the gap may be within the coordination between the capabilities of logistics agencies and contracting community.



# Capability Gaps Have Detrimental Effects



Source: GAO Report D11260T, *Measuring Disaster Preparedness*, March 17<sup>th</sup>, 2011



# Integrated Logistics and Contracting Planning

Explore methods to improve pre-planning in contingency contracting to complement logistics plan:

- shift response capability earlier to minimize lag and gaps
- utilize existing statutes and regulations
  - meeting CICA and other mandates via IDIQs and MACs
  - FAR Part 13 and 18, etc.



# Integrated Logistics and Contracting Planning

Explore methods to improve response posture in contingency contracting to complement logistics plan:

- employ reach-back and other capabilities early on
- integrate contracting, logistics, and other agencies in Phase Zero
  - Deliberate and Crisis Action Planning Processes
  - exercise CONPLAN and OPLAN responses in advance
  - tailor response to scope, size, and nature of event



# Graduate School of BUSINESS & PUBLIC POLICY

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